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A relationship study of personality traits and intensity-specific physical activity among university students

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Abstract

This study explores the relationship between personality traits and physical activity levels among university students. Utilizing a sample of 109 participants from Guru Nanak Dev University, ages 18 to 30, we measured intensity-specific physical activity and Big Five personality factors. WHO's Global Physical Activity questionnaire and the Big Five Inventory assessed the respective variables. Non-normally distributed data were analyzed using Spearman's rank-ordered correlation.

No significant correlations were found between vigorous intensity physical activity and any Big Five personality factors. However, agreeableness showed a significant positive correlation with moderate intensity physical activity, aligning with prior observations. Overall physical activity levels revealed significant positive correlations with agreeableness and openness. These findings highlight the multifaceted nature of the relationship between personality and physical activity among university students.

Despite contributing valuable insights, the study acknowledges limitations, including reliance on self-report measures. The results underscore the need for ongoing research to refine our understanding and inform tailored interventions promoting healthier lifestyles within the diverse university demographic.

Keywords: Personality traits, physical activity, university students, big five

Introduction

In the dynamic landscape of university life, where academic pursuits intertwine with personal growth, the relationship between personality traits and physical activity among university students emerges as a compelling area of exploration. Physical activity, encompassing a spectrum of movements demanding various skills and energy levels (Ainsworth *et al.*, 2011; Pate *et al.*, 1995) [17-18], is not merely a physical endeavor but a complex interplay between individual characteristics and lifestyle choices.

Drawing from a wealth of research, a nuanced understanding of this complex connection is beginning to unfold. Rhodes and Smith's (2006) [12] comprehensive review, synthesizing insights from five pivotal studies, sheds light on the association between personality traits and distinct patterns of physical activity. Notably, extraversion emerges as a key player, revealing a positive correlation with aerobic activities, while conversely, neuroticism exhibits a negative association with the same domain. Building upon this foundation, Howard *et al.* (1987) [15] provide empirical evidence suggesting that extraverts are more predisposed to engaging in dynamic activities such as aerobic exercises, swimming, aerobic dance, and sports like tennis, as opposed to their introverted counterparts. In contrast, introverts showcase a proclivity towards moderate-intensity activities such as gardening and household chores.

However, the complexity of this relationship is further underscored by the inconclusive findings regarding certain activities. For instance, Howard *et al.*'s (1987) [15] study reveals no significant correlation between extraversion and activities like cycling, walking, and jogging. This intriguing dimension challenges preconceived notions and beckons a more granular examination of the nuanced intersections between personality and specific types of physical engagement.

Recent research by Rhodes *et al.* (2017) [10] reinforces and refines these observations, reporting no discernible connections between neuroticism, extraversion, or conscientiousness and walking—an activity often embraced for its simplicity and accessibility. Moreover, the intricate interplay of personality extends to the realm of leisure and domestic activities, as demonstrated

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by Rhodes and Pfaeffli (2012) [13]. Their exploration reveals that individuals with type-A personalities are more inclined towards leisure-time pursuits but exhibit less engagement in domestic activities (Eason *et al.*, 2002) [16].

As we delve into the multifaceted relationship between personality traits and physical activity among university students, it becomes evident that this exploration holds significant implications not only for individual well-being but also for shaping comprehensive health and lifestyle interventions within the academic sphere. This paper aims to contribute to this evolving discourse, unraveling the intricate dynamics that govern the choices and behaviors of university students in the realm of physical activity.

Methods

The study included 109 students of Guru Nanak Dev University to participate in the study. The participants were of 18 to 30 years of age conveniently recruited from different departments of the University. The data was collected for two variables: Intensity-specific physical activity and Big-five personality factors.

Physical activity: WHO’s Global physical activity questionnaire was used to collect physical activity data. Physical activity was classified as moderate intensity physical activity and vigorous intensity physical activity. measuring unit of physical activity was metabolic equivalent of tasks (MET) value. One MET is equal to the energy cost during sitting quietly. METs assigned were 4 and 8 to moderate intensity activity and vigorous intensity activity respectively. Data were processed and cleaned according to the guidelines of WHO STEPS Surveillance Manual (WHO, 2017).

Personality traits: Big Five Inventory (BFI) was used to assess the personality traits of university students. 44-item inventory that measures an individual on the Big Five Factors

(Dimensions) of Personality (Goldberg, 1993) [11]. The following five personality factors were assessed in this analysis:

- Extraversion
- Agreeableness
- Conscientiousness
- Neuroticism
- Openness

Statistical Analyses

Since the data were not normally distributed, the relationship between physical activity and personality factors was assessed using the spearman’s rank ordered correlation. The alpha level was set at 0.05 p-value. IBM SPSS version 21 software was used to analyze the data.

Results

Table 1: Correlations between Vigorous intensity physical activity level and big five factors of personality

Variable	Vigorous intensity physical activity level	
	Spearman’s rho	Sig.
Extraversion	.046	.637
Agreeableness	.077	.427
Conscientiousness	.077	.428
Neuroticism	-.109	.260
Openness	.134	.166

Table 1 demonstrates the spearman’s correlations between vigorous intensity physical activity level and factors of personality. It is obvious from the above table that no significant correlations were seen between vigorous intensity physical activity level and extraversion ($r_s = -.046, p > .05$), agreeableness ($r_s = .077, p > .05$), conscientiousness ($r_s = .077, p > .05$), neuroticism ($r_s = -.109, p > .05$) and openness ($r_s = .134, p > .05$).

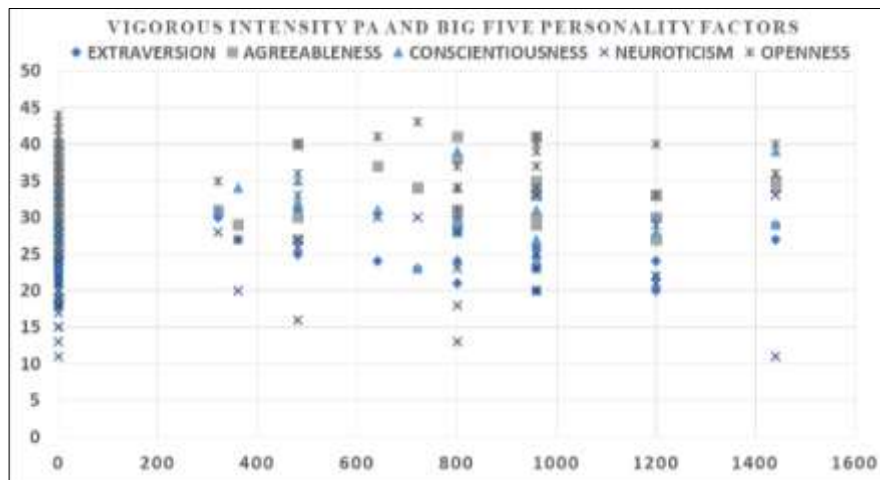


Fig 1: Scatter plots of vigorous intensity PA and Big five personality factors

Table 2: Correlations between Moderate intensity physical activity level and factors of personality

Variable	Moderate intensity physical activity level	
	Spearman’s rho	Sig.
Extraversion	.037	.699
Agreeableness	.215*	.025
Conscientiousness	.184	.055
Neuroticism	-.154	.109
Openness	.179	.063

Table 2 presents the spearman’s correlations between moderate intensity physical activity and factors of personality. It is evident from the above table that no significant correlations were seen between moderate intensity physical activity and extraversion ($r_s = .037, p > .05$), conscientiousness ($r_s = .184, p > .05$), neuroticism ($r_s = -.154, p > .05$) and openness ($r_s = .179, p > .05$). However, agreeableness ($r_s = .215, p < .05$) was significantly and positively correlated with moderate intensity physical activity.

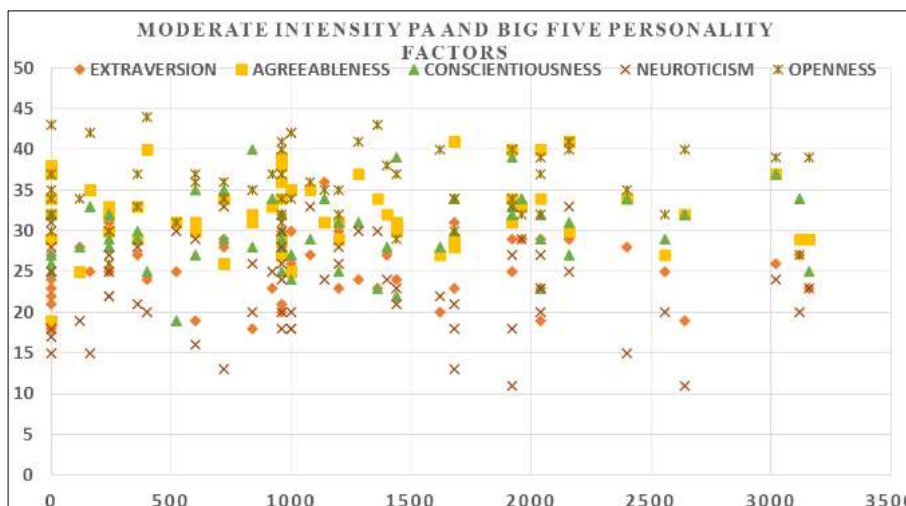


Fig 2: Scatter plots of moderate intensity PA and Big five personality factors

Table 3: Correlations between Overall physical activity level and factors of personality

Variable	Overall physical activity level	
	Spearman's rho	Sig.
Extraversion	.038	.695
Agreeableness	.208*	.030
Conscientiousness	.179	.062
Neuroticism	-.159	.099
Openness	.197*	.040

Table 3 shows the Spearman's correlations between overall physical activity level and factors of personality. It is evident from the above table that no significant correlations were seen between overall physical activity level and extraversion ($r_s = .038, p > .05$), conscientiousness ($r_s = .179, p > .05$) and neuroticism ($r_s = -.159, p > .05$). However, agreeableness ($r_s = .208, p < .05$) and openness ($r_s = .197, p < .05$) were significantly and positively correlated with overall physical activity.

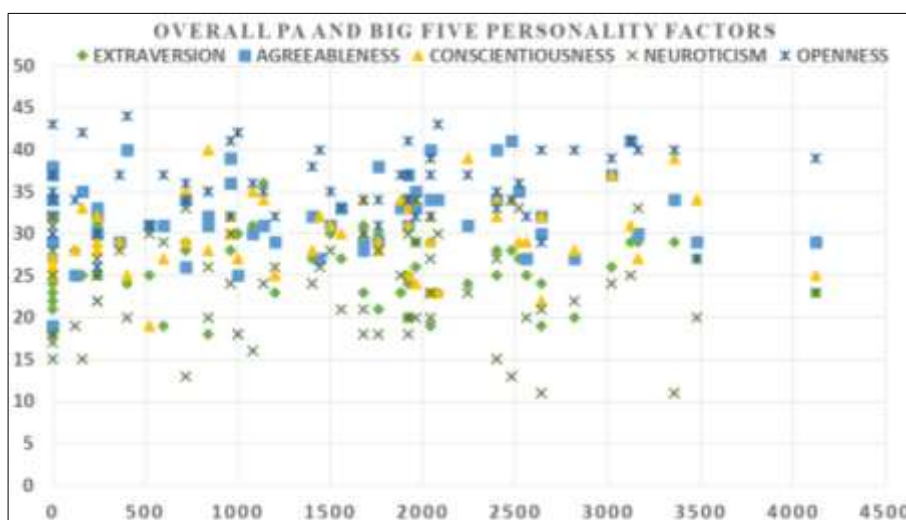


Fig 3: Scatter plots of overall PA and Big five personality factors

Discussions

The findings from the current study provide valuable insights into the relationship between personality traits and physical activity levels among university students. To contextualize these results, we compare them with earlier studies in the field, shedding light on consistencies and divergences. Contrary to some prior research (Rhodes & Smith, 2006) [12], our study did not reveal significant correlations between vigorous intensity physical activity and any of the Big Five personality factors. In particular, the absence of a significant association with extraversion contradicts earlier suggestions that extraverts may be more inclined towards aerobic activities. This incongruence might be attributed to the diverse nature of university populations, suggesting that individual preferences and lifestyle choices play a crucial role in the manifestation of these associations. Additionally, the lack of correlation between neuroticism and vigorous

physical activity contradicts previous findings suggesting a negative association (Rhodes & Smith, 2006) [12]. Our results indicate that the emotional stability associated with neuroticism may not be a defining factor in predicting engagement in vigorous physical activities among university students. It is crucial to acknowledge that such disparities could stem from methodological differences, variations in sample demographics, or cultural influences across studies. The significant positive correlation between agreeableness and moderate intensity physical activity aligns with Howard *et al.*'s (1987) [15] suggestion that extraverts are more likely to engage in activities like aerobic exercise, swimming, and playing tennis. This finding implies that students scoring higher on agreeableness may prefer collaborative or socially oriented moderate activities, underscoring the potential social aspect of their physical activity choices. Interestingly, our study did not find significant correlations between moderate

physical activity and extraversion, conscientiousness, neuroticism, and openness, unlike Howard *et al.*'s (1987) ^[15] observations. This discrepancy emphasizes the importance of considering nuanced factors, including cultural and contextual variations, when interpreting these relationships. Comparing the results for overall physical activity levels with previous research, our findings echo Rhodes *et al.*'s (2017) ^[10] observation that neuroticism, extraversion, and conscientiousness were not significantly associated with walking. However, our study reveals significant positive correlations between agreeableness, openness, and overall physical activity level. This suggests that individuals high in agreeableness and openness may exhibit a more comprehensive engagement in both vigorous and moderate physical activities, reinforcing the multifaceted nature of their active lifestyle.

Limitations and Future Directions

It is essential to acknowledge the limitations of this study, including the reliance on self-report measures and potential response biases. Future research could employ more objective measures, such as accelerometers, to enhance the accuracy of physical activity assessments. Additionally, exploring the influence of cultural factors and contextual variables on the personality-physical activity relationship could offer a more nuanced understanding.

Conclusion

In conclusion, while our study contributes valuable insights into the complex interplay between personality traits and physical activity levels among university students, the variations observed compared to earlier studies underscore the need for continued exploration. The dynamic nature of individual preferences and the diverse characteristics of university populations necessitate ongoing research to refine our understanding and inform tailored interventions promoting healthier and more active lifestyles among this demographic.

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